



Summary of Studies Supporting USDA Product Licensure

Establishment Name	Zoetis Inc.
USDA Vet Biologics Establishment Number	190
Product Code	1101.21
True Name	Bovine Rhinotracheitis Vaccine, Modified Live Virus
Tradename(s) / Distributor or Subsidiary (if different from manufacturer)	Bovi-Shield IBR - No distributor specified
Date of Compilation Summary	August 16, 2022

Disclaimer: Do not use the following studies to compare one product to another. Slight differences in study design and execution can render the comparisons meaningless.

Study Type	Efficacy
Pertaining to	Herpesvirus, bovine (IBR)
Study Purpose	Demonstrate efficacy against respiratory disease caused by infectious bovine rhinotracheitis
Product Administration	
Study Animals	Bovine
Challenge Description	
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	01/08/2001

Study Type	Efficacy
Pertaining to	Infectious bovine rhinotracheitis (IBR) virus
Study Purpose	Demonstrate a duration of immunity of at least 280 days against respiratory disease caused by IBR virus
Product Administration	One dose administered subcutaneously
Study Animals	20 vaccinated and 10 control calves, four to five months of age, seronegative to IBR
Challenge Description	IBR virus administered 280 days post-vaccination
Interval observed after challenge	Animals were observed daily for 14 days following challenge
Results	<p>IBR disease was the efficacy variable. IBR disease was defined as whether an animal ever exhibited one of the following clinical signs: depression, mucopurulent nasal discharge, and/or increased respiratory effort and sounds.</p> <p>IBR disease: Controls: 10/10 (100%) Vaccinates: 0/20 (0%)</p> <p>See individual data attached.</p>
USDA Approval Date	March 19, 2010

IBR Disease by Treatment, Day and Animal

Controls

Animal	Day																
	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294
39	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
42	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
43	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No
54	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
56	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
61	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No
63	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No
65	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
68	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No

Vaccinates

Animal	Day																
	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294
37	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
41	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
44	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
46	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
47	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
48	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
49	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
50	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
51	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
52	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
53	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
55	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
57	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
58	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
59	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
60	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
64	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
67	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
71	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
72	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Study Type	Efficacy
Pertaining to	Herpesvirus, bovine [Infectious Bovine Rhinotracheitis (IBR) Virus]
Study Purpose	Demonstrate efficacy against respiratory disease caused by IBR
Product Administration	One dose administered intramuscularly (IM) or subcutaneously (SC)
Study Animals	20 IM vaccinates, 20 SC vaccinates, and 10 control calves, 6–8 months of age and seronegative to IBR (serum neutralizing antibody titer < 1:2). The study was conducted per 9 CFR 113.310.
Challenge Description	IBR virus administered on day 35
Interval observed after challenge	Animals were observed daily for 14 days
Results	<p>Animals were considered to have IBR disease if a clinical sign was observed/detected on at least one day post-challenge to include depression, nasal discharge, rectal temperature , or increased respiratory effort.</p> <p>Number of animals affected (IBR disease): Controls: 10/10 (100%) IM vaccinates: 4/20 (20%) SC vaccinates: 2/20 (10%)</p>
USDA Approval Date	01/23/2008

IBR Disease: Depression

Treatment Group	Animal Id	Study Day															
		35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	
Controls	2119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2123	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	
	2145	0	0	0	0	0	1	1	1	1	0	1	1	0	0	0	
	2148	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	
	2153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2161	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	
	2171	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	
	2178	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	
	2197	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	
2200	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0		
IM Vaccinates	2122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2185	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2188	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2198	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2199	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SC Vaccinates	2121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

0 = Normal. Alert, active, stands, moves and responds to stimuli quickly and steadily, shows continuous interest in surroundings.

1 = Mild. Tends to lie down frequently, lethargic and somnolent, stands, moves and responds to stimuli reluctantly and unsteadily, holds head low, staggers, shows little interest in surroundings.

2 = Severe. Recumbent or shows little or no response to stimuli or stands/moves with difficulty.

IBR Disease: Nasal Discharge

Treatment Group	Animal Id	Study Day															
		35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	
Controls	2119	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
	2123	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	
	2145	0	0	0	1	1	1	1	1	1	1	0	1	0	1	0	
	2148	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	
	2153	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	
	2161	0	0	0	0	0	1	1	1	1	1	1	0	1	1	0	
	2171	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
	2178	0	0	0	0	0	1	1	0	0	0	1	1	1	0	0	0
	2197	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	1
2200	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	
SC Vaccinates	2122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2174	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
	2176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2185	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2188	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2198	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0		
2199	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
IM Vaccinates	2121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2130	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	2132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2156	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	
	2162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2172	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	2175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

0 = No discharge/small amount of discharge (approx. 1 mL or less) of clear, mucoid or whitish discharge.

1 = Mild. Notable amount (approx. 2–3 mL or more) of clear mucoid discharge streaked with mucopurulent discharge running down the nostrils.

2 = Severe. Notable amount (approx. 2–3 mL or more) of mucopurulent discharge running down the nostrils.

IBR Disease: Respiratory Effort

Treatment Group	Animal Id	Study Day															
		35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	
Controls	2119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2161	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
	2171	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
	2178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SC Vaccinates	2122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2185	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2188	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2198	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2199	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
IM Vaccinates	2121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

0 = Normal. Respirations are shallow and mostly thoracic (difficult to see at a distance of approximately 10 feet).

1 = Mild. Respirations are rapid, labored and mostly abdominal.

2 = Severe. Respirations are very labored or animal grunts during breathing.

Rectal Temperatures (°C)

Treatment Group	Animal Id	Study Day														
		35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Controls	2119	39.1	38.9	38.9	40.9	40.4	40.4	40.5	39.9	39.5	39	38.7	38.5	38.7	38.7	38.7
	2123	39.2	39.1	40.4	41.6	41.5	41.4	40.4	40.5	40.7	40.6	39.9	39	38.9	38.8	38.6
	2145	39.4	39	39.2	41.7	41.3	41.1	40.6	39.7	40	40	38.9	38.8	39.2	39.2	39
	2148	39.1	39.3	39.3	40.8	41.3	40.4	40.4	40	39.5	39.1	39	39.1	38.7	38.7	38.6
	2153	39.4	39.2	39.3	39.9	40.7	40.4	40	39	39.6	39.2	39.2	38.9	39.3	39.3	39.1
	2161	39.2	39.6	41	42.3	41.7	41.5	40.9	40.4	40.1	39.9	39.3	39.3	38.9	39	38.7
	2171	39.3	39.2	39.3	41.8	40.7	40.9	40.7	40.6	40.6	40.6	39.6	39.3	38.8	39.2	38.6
	2178	39.2	39.2	38.8	41.2	41.7	41.2	41.1	40.7	40.1	39.4	39.2	39.1	38.9	39.1	39.1
	2197	39.1	39	39.4	41.6	41.4	40.4	40.4	40.5	39.6	39.7	39	39.1	38.6	38.9	38.8
	2200	39.5	39.3	39.3	41.1	40.6	40.9	40.3	40.2	39.7	39.8	38.9	39.1	38.8	38.9	39.1
SC Vaccinates	2122	39.3	39.1	39.3	39.2	39.5	39	39.1	39	39	38.9	39.2	38.7	39.1	39.1	39.2
	2126	39	38.8	38.9	38.9	38.7	38.8	39	38.6	38.9	38.9	38.8	38.9	38.6	38.7	38.7
	2127	39.4	39.3	39	39.3	39.1	39.1	39.6	39.1	39.5	39.2	39.2	39.3	39.4	38.9	38.9
	2131	39.1	39	38.8	39.2	39	38.8	38.7	39.7	39.4	38.7	38.8	38.7	39.1	38.8	39.1
	2140	39.1	38.9	39	38.6	38.7	38.8	38.8	38.7	38.8	38.7	38.6	38.7	38.7	39.1	38.8
	2150	38.9	39	38.9	38.8	39.1	39	38.7	38.6	38.8	38.9	38.8	38.7	38.9	38.9	38.9
	2151	39.3	39.2	39	39	38.9	38.7	38.9	38.9	38.8	38.8	38.7	38.8	38.8	38.9	38.5
	2155	39.3	39.2	38.7	39	39.2	38.8	39	38.8	38.9	39.1	39	39.1	39	38.8	38.9
	2163	39.2	39	38.9	38.9	38.9	39	39.3	38.7	38.6	38.8	38.9	39	38.7	39.1	39
	2164	39.2	39.3	39.3	39	39.5	39.4	39	39.3	39.1	39.2	39	39.3	38.8	38.7	38.9
	2168	38.7	38.9	38.7	39	39.1	39	38.7	38.9	39	38.8	38.8	38.7	39	38.7	39.2
	2174	39	38.9	38.9	40.4	40.5	40.3	38.9	38.8	38.7	38.9	38.9	39	38.8	38.6	38.8
	2176	39	38.8	39.1	39.3	38.8	39.1	38.8	38.8	39.1	38.9	39.1	38.8	38.7	38.6	39
	2181	38.9	39.2	38.7	38.8	39.2	39.4	39.2	39.3	38.9	39.1	38.8	38.7	39	38.8	39.1
	2183	38.9	38.9	38.8	39	39.1	39	38.8	38.7	38.8	38.8	39	39.1	38.5	39	39.1
	2185	39.2	39.6	39.5	40.5	40.1	39.9	39.1	39.3	39.1	39.1	39.2	39.1	39	38.8	39.3
	2188	39.4	39.5	39.6	39.4	39.1	39.4	39.4	39.4	39.2	39.4	39.4	39	39.3	39.1	39.2
	2189	38.8	38.8	39	38.6	39.1	38.7	38.7	38.8	39	38.9	39	39.1	38.9	39	38.7
	2198	39.3	39.2	38.9	39.1	38.8	39	39.1	39	38.8	38.9	38.9	39	38.8	38.8	38.7
	2199	39.1	39.1	39	38.9	39.2	38.9	38.9	39.1	39.3	39	39	39	38.8	38.8	38.8
IM Vaccinates	2121	38.9	39.1	38.9	38.7	39	39	38.8	38.9	39.2	38.7	39.1	38	38.7	38.9	38.9
	2124	39	38.9	39.1	39.2	39	39	39.1	38.9	39.1	38.8	39.2	38.9	39	38.7	38.9
	2125	39	38.8	38.8	38.8	38.9	38.8	38.8	38.9	38.9	38.9	39.1	39.1	38.9	39	39.1
	2128	39.2	39	39.1	38.9	38.9	39.1	38.7	39.2	39.1	38.9	38.9	38.9	38.9	38.9	38.8
	2129	39	39.2	39.2	39.3	39.3	39.2	38.9	39.4	39.1	39.1	39.4	38.7	38.9	38.8	39.1
	2130	39	39.2	39	39.3	38.9	38.9	38.9	39.1	39.2	39	39	39.1	38.7	38.6	38.8
	2132	39.6	39.9	39.4	39.2	39.5	39.4	39.2	39	39.2	39	39.3	39.1	39.2	39	39.1
	2133	38.9	38.8	38.8	38.9	38.8	38.8	38.9	38.7	38.8	38.6	39.1	38.8	38.8	38.6	38.7
	2139	39	39.2	39.4	38.7	38.9	38.8	39	39.1	38.7	38.9	38.7	38.9	38.9	39	38.8
	2147	39	39	38.9	38.8	39	38.9	38.8	38.8	38.7	38.7	38.6	38.8	39.2	38.7	38.8
	2149	39.2	39.2	38.9	39.1	39	38.8	38.8	38.9	38.7	38.7	39.2	38.7	38.7	38.7	38.9
	2156	39	38.9	38.9	39.1	39.2	39.3	39.2	38.8	38.6	38.8	38.9	38.7	38.9	38.8	39.1
	2162	38.9	39.3	39.3	38.9	39.2	39.4	38.9	39	39	38.9	39.4	38.9	38.8	38.7	39.1
	2166	39.2	39.1	38.9	39.3	39.1	39.1	38.8	39	38.9	39.2	39.3	39.1	38.9	38.9	38.8
	2167	38.9	38.6	38.7	38.7	38.7	38.7	38.9	38.6	38.7	38.8	38.6	38.8	38.7	38.9	38.7
	2169	39.3	39.1	38.9	39	39	39.3	38.9	39	39.2	38.9	39.1	39.1	38.8	39	39
	2172	39.9	39	38.8	39.2	38.8	38.9	39.1	39.1	38.9	38.9	38.9	39	38.9	38.8	38.6
	2175	39.1	38.8	38.6	38.6	38.9	39	38.7	38.7	38.8	38.6	38.9	39	38.7	38.9	38.6
	2177	39.1	39.5	39.3	39.3	39	39	38.9	39.1	38.7	39	39.6	38.9	39.1	38.9	39
	2193	39	39.3	39	39.1	39.3	38.9	38.8	39.5	39.1	39	38.8	38.8	38.6	38.7	39

IBR Serum Neutralization

Treatment Group	Animal Id	Study Day			
		0	27	34	49
Controls	2119	<2	<2	<2	38
	2123	<2	<2	<2	23
	2145	<2	<2	<2	76
	2148	<2	<2	<2	54
	2153	<2	<2	<2	38
	2161	<2	<2	<2	54
	2171	<2	<2	<2	76
	2178	<2	<2	<2	27
	2197	<2	<2	<2	76
	2200	<2	<2	<2	76
SC Vaccinates	2122	<2	11	16	431
	2126	<2	32	23	215
	2127	<2	16	16	215
	2131	<2	29	27	128
	2140	<2	27	23	152
	2150	<2	19	19	181
	2151	<2	23	23	304
	2155	<2	38	45	45
	2163	<2	14	16	215
	2164	<2	19	19	152
	2168	<2	36	23	181
	2174	<2	6	4	362
	2176	<2	13	19	609
	2181	<2	23	23	304
	2183	<2	9	10	304
	2185	<2	10	5	512
	2188	<2	13	11	362
	2189	<2	13	13	215
	2198	<2	32	32	181
	2199	<2	18	27	362
IM Vaccinates	2121	<2	23	27	128
	2124	<2	16	16	256
	2125	<2	16	19	45
	2128	<2	19	19	362
	2129	<2	16	16	54
	2130	<2	27	23	256
	2132	<2	13	16	304
	2133	<2	38	45	304
	2139	<2	32	45	76
	2147	<2	13	16	256
	2149	<2	45	38	181
	2156	<2	13	13	91
	2162	<2	13	10	609
	2166	<2	11	13	431
	2167	<2	27	23	108
	2169	<2	11	13	152
	2172	<2	19	23	152
	2175	<2	13	16	152
	2177	<2	6	6	256
	2193	<2	45	45	181

Titers are expressed as the greatest neutralizing dilution.

Study Type	Efficacy
Pertaining to	Herpesvirus, bovine [Infectious Bovine Rhinotracheitis (IBR)]
Study Purpose	Demonstrate efficacy against respiratory disease caused by IBR
Product Administration	
Study Animals	Bovine
Challenge Description	
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	01/08/2001

Study Type	Safety
Pertaining to	ALL
Study Purpose	Demonstrate safety in calves nursing pregnant cows
Product Administration	
Study Animals	Bovine
Challenge Description	NA
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	08/06/2002

Study Type	Safety
Pertaining to	Herpes Virus, Bovine [Infectious Bovine Rhinotracheitis (IBR) virus]
Study Purpose	Demonstrate safety under field conditions
Product Administration	
Study Animals	Bovine
Challenge Description	NA
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	05/13/1998

Study Type	Safety
Pertaining to	Herpes Virus, Bovine [Infectious Bovine Rhinotracheitis (IBR) virus]
Study Purpose	Demonstrate safety under field conditions
Product Administration	
Study Animals	Bovine
Challenge Description	NA
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	08/06/2002

Study Type	Safety
Pertaining to	Herpes Virus, Bovine [Infectious Bovine Rhinotracheitis (IBR) virus]
Study Purpose	Demonstrate safety under field conditions
Product Administration	
Study Animals	Bovine
Challenge Description	NA
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	08/06/2002

Study Type	Safety
Pertaining to	Herpes Virus, Bovine [Infectious Bovine Rhinotracheitis (IBR) virus]
Study Purpose	Demonstrate safety under field conditions
Product Administration	
Study Animals	Bovine
Challenge Description	NA
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	05/13/1998